<u>REMARKS</u>

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-4, 6-10, 12-16, and 18 are currently pending. Claims 5, 11, and 17 have been canceled without prejudice; and Claims 1, 2, 3, 6, 7, 9, 12, 13, 15, and 18 have been amended by the present amendment. The changes to the claims are supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, Claims 1-18 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter; and Claims 1-18 were rejected under 35 U.S.C. §102(b) as being anticipated by <u>Mosterman et al.</u> ("A Comprehensive Methodology for Building Hybrid Models of Physical Systems").

Amended Claim 1 is directed to a simulation method for simulating a behavior of a mechanism of <u>a mechanical device that is regulated by mechanism control software</u>, using a hybrid model of the mechanical device, the hybrid model including a state transition model transition and a continuous system model, the method comprising: (1) analyzing the hybrid model to extract first description data of the state transition model and second description data of the continuous system model; (2) generating a table representing a relationship between continuous system equations and switching conditions thereof, based on the extracted first description data; (3) generating a plurality of internal data expressions of <u>all</u> the continuous system equations, based on the extracted second description data; (4) starting a simulation of the mechanism after completion of generating the table and generating the internal data expressions; (5) selecting an active continuous system equation by looking up the table according to an occurrence of an event; and (6) outputting data that represents the behavior of the mechanism by solving the selected active continuous system equation by numerical integration using one or more of the internal data expressions that corresponds to

the selected active continuous system equation, wherein <u>the outputted data is supplied to the mechanism control software as a response to a control signal provided from the mechanism control software</u>. The changes to Claim 1 are supported by the originally filed specification and do not add new matter.

Applicant respectfully submits that the rejection of Claim 1 under 35 U.S.C. §101 is rendered moot by the present amendment to Claim 1. Claim 1 has been amended to be directed to a simulation method for simulating a behavior of a mechanism of <u>a mechanical device that is regulated by mechanism control software</u>, including the steps of <u>outputting data that represents the behavior of the mechanism, wherein the outputted data is supplied to the mechanism control software</u> as a response to a control signal provided from the mechanism control software. Accordingly, Applicant respectfully submits that amended Claim 1 is directed to an invention that produces a useful, concrete, and tangible result. Amended Claim 1 outputs data that represents the behavior of the mechanism of the mechanical device that is supplied to the mechanism control software that regulates the mechanical device. Applicant respectfully submits that outputting data that is used to regulate a mechanical device is useful, concrete and tangible.

Moreover, Applicant notes that because Claim 1 recites generating a plurality of internal data expressions of all the continuous system equations before starting the simulation of the mechanism, it has the advantage of avoiding the need to execute a garbage collection process during execution. For this additional reason, Applicant respectfully submits that amended Claim 1 produces a useful result.

Moreover, Applicant respectfully submits that amended Claim 1 does not cover every substantial practical application of an idea, law of nature, or natural phenomenon and is not in practical effect, a patent on the idea, law of nature, or natural phenomenon itself. Rather, Claim 1 is directed to a simulation method for simulating behavior of a mechanism of <u>a</u>

mechanical device that is regulated by mechanism control software using a hybrid model of the mechanical device. Thus, by the plain language of Claim 1, Claim 1 is directed to a simulation method for simulating behavior of a mechanism of a mechanical device.

Accordingly, for the reasons stated above, Applicant respectfully submits that the rejection of Claim 1 under 35 U.S.C. §101 is rendered moot by the present amendment to Claim 1. Independent Claims 6, 7, 12, 13, and 18 recite limitations analogous to the limitations recited in Claim 1. Moreover, Claims 6, 7, 12, 13, and 18 have been amended in a manner analogous to the amendment to Claim 1. Accordingly for reasons analogous to the reasons stated above for the patentability of Claim 1, Applicant respectfully submits that the rejection of the independent claims under 35 U.S.C. §101 are rendered moot by the present amendment to the independent claims.

Regarding the rejection of Claim 1 as anticipated by the Mosterman et al. reference, the Mosterman et al. reference is directed to a comprehensive and systematic framework for building mixed continuous/discrete hybrid physical system models. In particular, the Mosterman et al. reference discloses a framework for modeling and analysis of hybrid models of physical systems by simplifying the behavior of complex physical systems using discrete transitions of plural linear systems. For example, as shown on pages 194-203, the Mosterman et al. reference discloses a continuous model, a discrete model, and state transitions for the classic falling rod problem.

However, Applicant respectfully submits that the Mosterman et al. reference fails to disclose the step of generating a plurality of internal data the expressions of all the continuous system equations, based on an extracted second description data prior to the step of starting a simulation of the mechanism after completion of generating the table and generating the internal data expressions, as recited in amended Claim 1. In this regard, Applicant notes that by generating a plurality of internal data expressions of all the continuous system equations

prior to the simulation, undesirable affects regarding garbage collection can be avoided.

Although the avoidance of garbage collection during execution is not explicitly claimed, this

is a natural by-product of the claimed invention. However, Applicant respectfully submits

that the Mosterman et al. reference does not address this problem. In particular, Applicant

respectfully submits that the Mosterman et al. reference fails to disclose generating a plurality

of internal data expressions of all the continuous system equations, based on the extracted

second description data, wherein the second description data of the continuous system models

are obtained by analyzing the hybrid model, as recited in Claim 1. In this regard, Applicant

notes that the Office Action cites to pages 202-204 and Figures 18 and 19 as disclosing the

step of generating a plurality of internal data expressions. However, Applicant notes that

Figure 18 merely shows a number of trajectories in phase space, while Figure 19 shows a

boundary in phase space. However, Applicant respectfully submits that the cited sections in

the Mosterman et al. reference fail to disclose generating a plurality of internal data

expressions of all the continuous system equations prior to starting simulation of the

mechanism, as required by Claim 1.

Accordingly, for the reasons stated above, Applicant respectfully submits that

amended Claim 1 (and all associated dependent claims) patentably defines over the
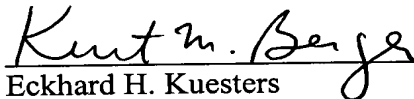
Mosterman et al. reference.

Independent Claims 6, 7, 12, 13, and 18 recite limitations analogous to the limitations

recited in Claim 1. Moreover, Claims 6, 7, 12, 13, and 18 have been amended in a manner

analogous to the amendment to Claim 1. Accordingly, for reasons analogous to the reasons

stated above for the patentability of Claim 1, Applicant respectfully submits that the rejection

of Claims 6, 7, 12, 13, and 18 are rendered moot by the present amendment to the

independent claims.

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Thus, it is respectfully submitted that independent Claims 1, 6, 7, 12, 13, and 18 (and

all associated dependent claims) patentably define over the <u>Mosterman et al.</u> reference.

Consequently, in view of the present amendment and in light of the above discussion,

the outstanding grounds for rejection are believed to have been overcome. The application as

amended herewith is believed to be in condition for formal allowance. An early and

favorable action to that effect is respectfully requested.

Respectfully submitted,

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